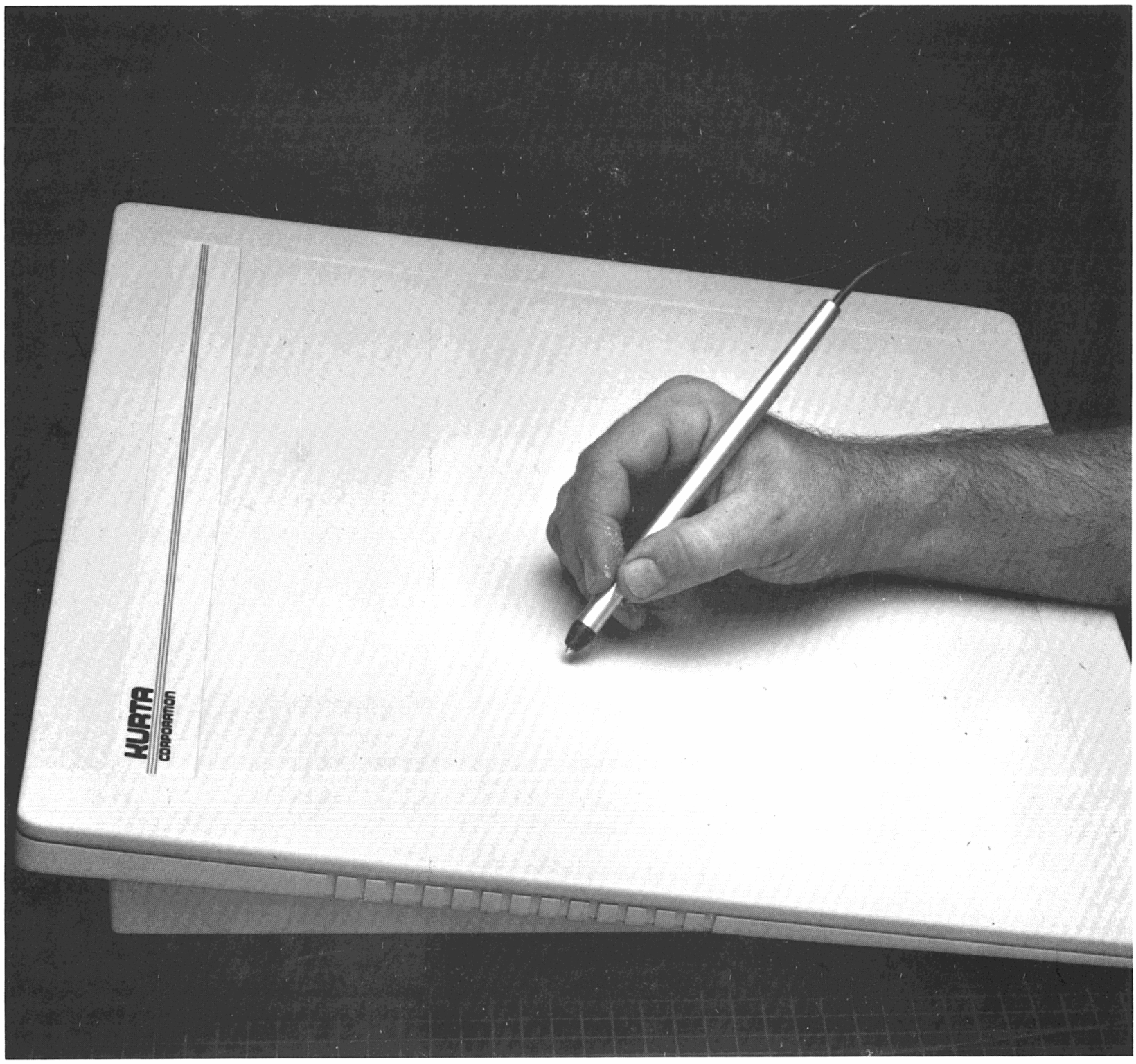
KURTA CORPORATION

Series TWO
The Sloped Dimension



GRAPHICS TABLET
USER'S MANUAL

Series TWO
The Sloped Dimension

GRAPHICS TABLET
USER'S MANUAL

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KURTA
CORPORATION

FCC RADIO FREQUENCY INTERFERENCE STATEMENT WARNING

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna
- Relocate the computer with respect to the receiver
- Move the computer away from the receiver
- Plug the computer into a different outlet so that computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the US Government Printing Office, Washington, D.C. 20402 Stock No. 004-000-00398-4."

NOTE: Your graphics tablet has been granted an equipment authorization of compliance with Federal Communication Commission Rules Part 15 of Equipment Class B Computing Device Peripherals under the following certification:

DMA 8C9 SERIES TWO

INTRODUCTION

Welcome to a new dimension of computer graphics! Your Series TWO Graphics Tablet offers a wide variety of graphic features that will allow you to draw, menu select and add the dimension of graphics to your computer system.

Your graphics tablet is compatible with many graphics software packages available for personal computers supporting an RS232 serial interface. It may also be used in conjunction with BASIC, assembler, or other language programs that you may write for your own applications. In fact, we have included some BASIC programs that will show you how the tablet works, and also may help get you started writing your own applications programs.

The Series TWO Graphics Tablet is microprocessor driven and uses a pen or optional cursor to generate output data consisting of x and y coordinates as well as pen status information. A soft keyboard provides tablet control with the touch of the pen or optional cursor. The microprocessor will also accept commands loaded from the host computer. Programmable point, draw, delta, auto, and menu modes as well as origin relocation, skew correction and resolution scaling support many tablet, workstation and keyboard applications.

Your Tablet can output data scaled to match the host monitor pixel requirements. The host can also program a change to other resolutions for printer output or data calculations. The built-in, powerful microprocessor minimizes host processing, control, and management tasks.

The following pages detail configuration information, setup instructions, and examples of BASIC programs that demonstrate how your Tablet works. Take a few minutes to familiarize yourself with them as you become acquainted with the unit.

SERIES II MODELS
Model 200 = 200 PPI Resolution
Model 400 = 400 PPI Resolution
Model 1000 = 1000 PPI Resolution

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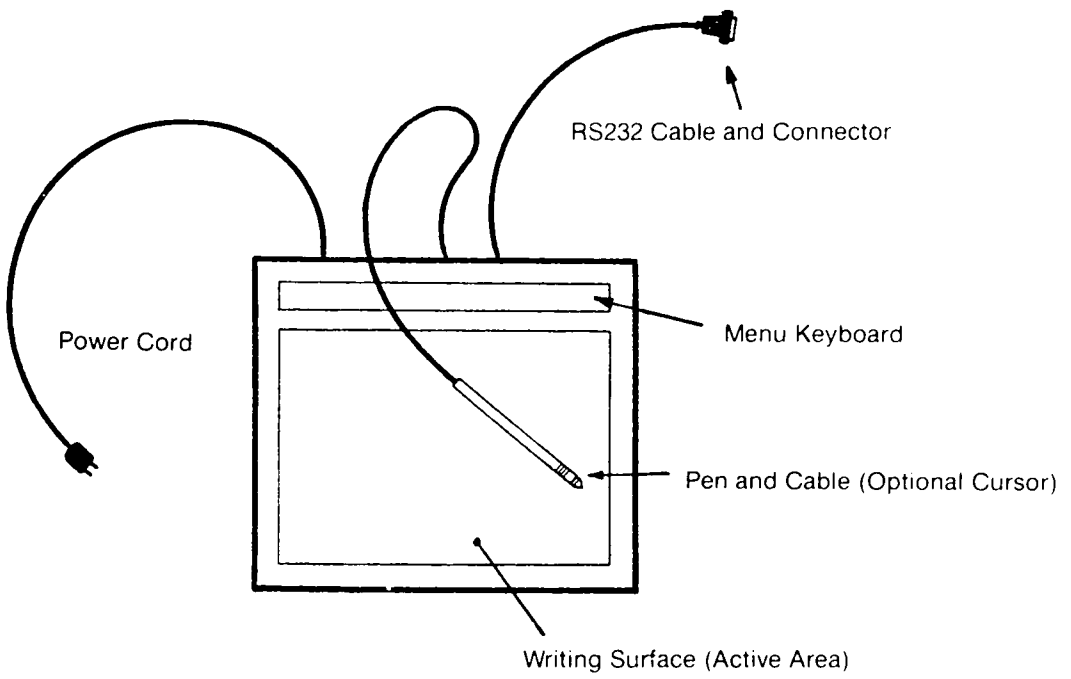
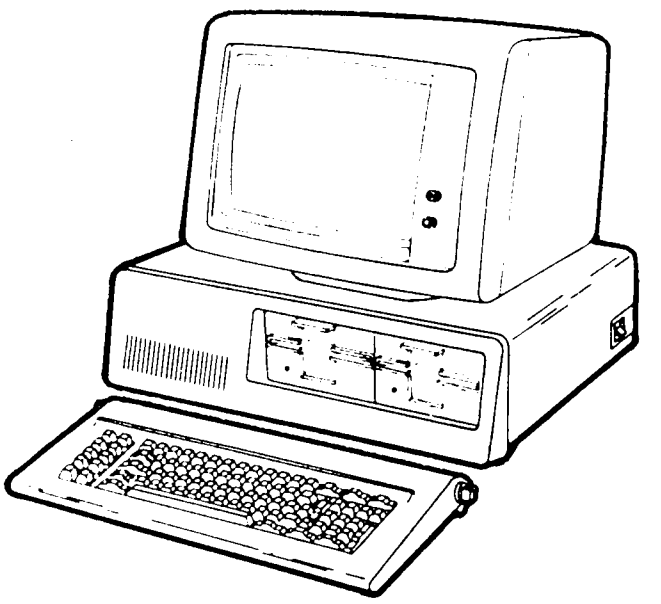
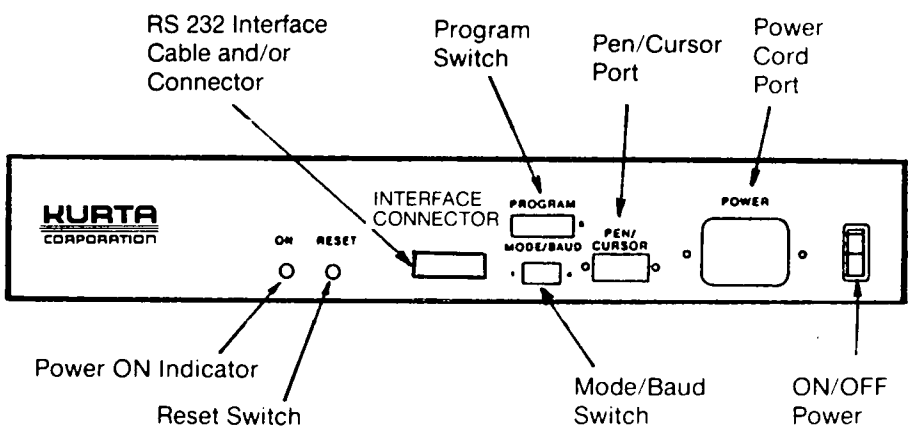
SYSTEM CONFIGURATION AND SETUP



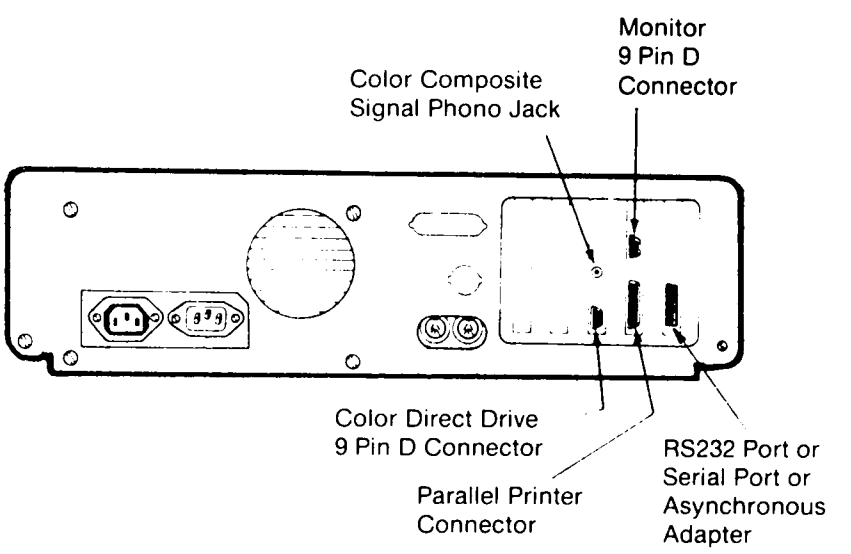
KURTA SERIES TWO GRAPHICS TABLET



Mini, Micro or Personal Computer with an RS232 Interface



KURTA SERIES ONE REAR PANEL


Monitor 9 Pin D Connector
Color Composite Signal Phono Jack
Color Direct Drive 9 Pin D Connector
Parallel Printer Connector
RS232 Port or Serial Port or Asynchronous Adapter

REAR PANEL

INVENTORY CHECKLIST

- ☐ Series TWO Graphics Tablet
- ☐ RS232 Cable and Connector
- ☐ Pen and/or Optional Cursor
- ☐ Power Cord
- ☐ Menu Overlay
- ☐ Writing Surface Overlay
- ☐ User's Manual
  and/or
- ☐ Software Package

*NOTE: Three-pronged power cord is required for proper tablet operation as well as for safety and RFI reasons.

SYSTEM SETUP

With tablet *and* computer power OFF:

- ☐ Set Mode/Baud Switches 3 & 4 and Program Switch 3 to computer Baud rate.
- ☐ Verify Program Switch and Mode Switch are set to software program requirements
- ☐ Connect Tablet RS232 cable to tablet and computer RS232 serial port or asynchronous port
- ☐ Plug in pen/cursor to pen/cursor port
- ☐ Connect Power cord to tablet
- ☐ Plug in tablet power cord to 115 VAC 60 Hz*
- ☐ Turn on tablet
- ☐ Verify tablet POWER ON indicator is lit.
- ☐ Turn on computer

Your graphics system is now ready for use. You may either load a graphics software diskette (you may need to load the computer operating system first) and begin using your new tablet and graphics software, or you may go to the OPERATIONS section and learn a bit more about your tablet first.

HARDWARE CONFIGURATION AND SETUP

MODE/BAUD SWITCH SETUP

The Mode/Baud Switch on the rear panel sets the default modes of operation and baud rates at POWER ON or RESET. The user can subsequently change the modes using the menu if the menu has been turned on by program switch or external input. In addition, modes may be externally programmed. (See Appendix 3: Input Formats.)

NOTE: Tablet Baud rate must be set to computer Baud rate for proper operation.

MODES OF OPERATION:

AUTO: continuous data output when pen or cursor is within proximity of the surface active area or pen/cursor switch is activated.

DRAW: continuous data output when writing, tracing or drawing and pen/cursor switch is activated.

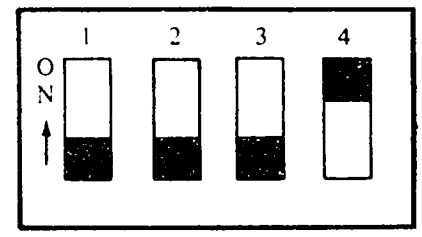
POINT: single point data output upon pen/cursor switch activation.

DELTA: single data output for each 0.01 inch predefined increment of pen/cursor movement when pen/cursor switch is activated.

BAUD RATE:

Data transmission speed expressed in bits/second. Eight standard Baud rates are provided. See Table at right and Program Switch 3 below.

REAR PANEL VIEW



MODE/BAUD SWITCH

SETUP TABLE

MODE/BAUD SELECTION	SWITCH POSITION 1	2	3	4
Modes: Auto	OFF	OFF		
Draw	OFF	ON		
Point	ON	OFF		
Delta	ON	ON		
Baud Rate:				
High 19200			OFF	OFF
9600			OFF	ON
4800			ON	OFF
Low 2400			ON	ON

HIGH RANGE: Program Switch 3 = OFF
LOW RANGE: Program Switch 3 = ON

PROGRAM SWITCH SETUP

The Program Switch located on the rear panel defines during POWER ON or RESET the modes of operation, resolution, menu internal and external operation, and output format selection. The program switch selections can subsequently be changed or externally programmed by a program input message. (See Appendix 3: Input Formats.)

OUTPUT FORMAT: Two output formats are provided for the user. Format 2 is binary coded and is compatible with standard industry tablets. Format 5 provides for ASCII (BCD) data output that can be directly displayed with BCD characters. (See Appendix 4: Output Formats.)

BAUD RATE: Two ranges of Baud Rate are provided:

Switch 3	Baud Rates
OFF = High	19200, 9600, 4800, 2400
ON = Low	1200, 600, 300, 150

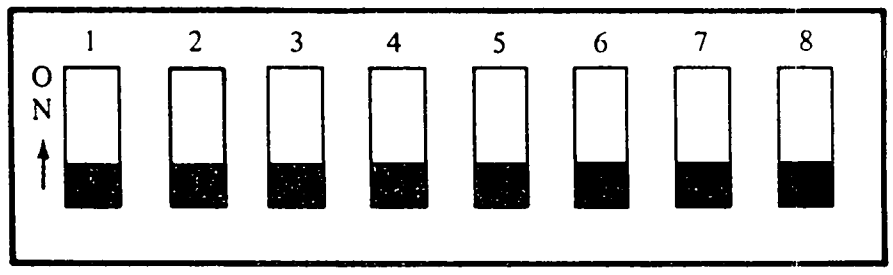
NOTE: Both Mode/Baud Switches 3 & 4 and Program Switch 3 must be set to obtain correct Baud Rate.

*RESOLUTION: Two resolutions provide data output as follows:

Switch 4	Model 200	Model 400	Model 1000
OFF	200	400	1000
ON	100	200	500

(See Menu Keyboard (LO RES and HI RES) and Appendix 1: Origin Set and Resolution.)

REAR PANEL VIEW



PROGRAM SWITCH

SETUP TABLE

PROGRAM SELECTIONS	SWITCH POSITIONS 1	2	3	4	5	6	7	8
Output Format: 2	ON	OFF						
5	ON	ON						
Baud Rate: High			OFF					
Low			ON					
*Resolution: Normal				OFF				
Half				ON				
Remote Mode: Inactive					OFF			
Active					ON			
Internal Menu Operation: Active						OFF		
Inactive						ON		
External Menu Operation: Active							OFF	
Inactive							ON	

HARDWARE CONFIGURATION AND SETUP (continued)

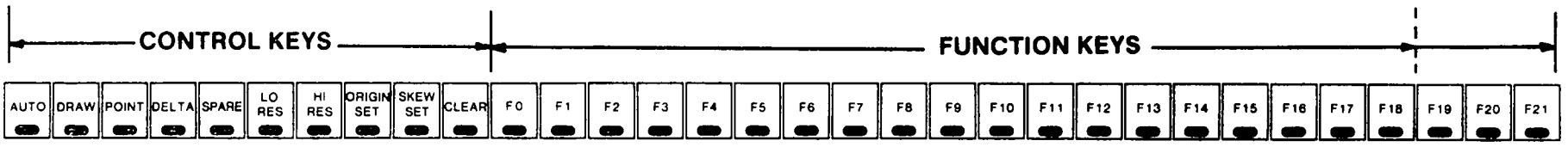
PROGRAM SWITCH SETUP (continued)

REMOTE MODE: When remote mode is inactive (Switch 5 OFF), tablet outputs data in mode selected (Auto, Draw, Point, Delta). When active (Switch 5 ON), tablet will output data only upon receipt of "DATA REQUEST" command from host.

MENU INTERNAL AND EXTERNAL OPERATIONS: Switches 6 and 7 together control the operation of the menu keyboard. The menu keyboard may be divided into CONTROL KEYS and FUNCTION KEYS. CONTROL KEYS (AUTO through CLEAR) can change tablet operations or send a character to the Host when selected. FUNCTION KEYS (F0-F21) can send only a character to the host. See MENU KEYBOARD for more detailed description and table at right for switch settings.

INTERNAL Switch 6	OFF	OFF	ON	ON
EXTERNAL Switch 7	OFF	ON	OFF	ON
MENU CONTROL	CHANGES OPERATION	CHANGES OPERATION	SEND MESSAGE	—
FUNCTION KEYS	SEND MESSAGE	—	SEND MESSAGE	—

The MESSAGE that will be sent by the tablet to the computer when SEND MESSAGE is listed in the MENU Operations table is indicated beneath each Key in the diagram below. X data equals Menu Key location and Y data equals zero (0). (See Appendix 4: Output Formats and Format Notes for Status.)



PEN AND CURSOR ASSEMBLIES

PEN ASSEMBLY

PEN PRESSURE AND SWITCH OPERATION: Your PEN has an internal switch housed inside the BARREL ASSEMBLY. The switch is activated when the PEN is pressed down on *any* surface; however, MENU FUNCTIONS or X, Y coordinates are transmitted only when the pen is in proximity to the MENU or WRITING SURFACE.

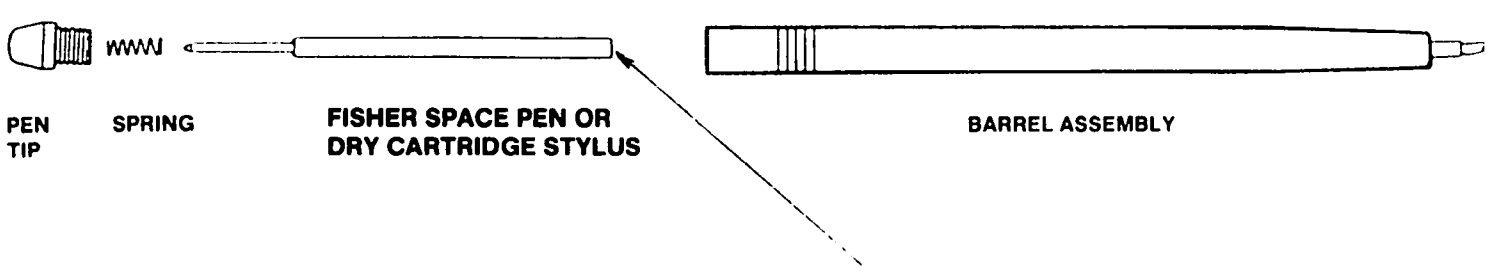
NOTE: *Normal writing pressure* is sufficient to fully activate the PEN SWITCH. (Press the exposed tip of the CARTRIDGE to your finger to see and feel the amount of movement and pressure required.)

Although the pen is ruggedly designed for years of use, it is still a precision instrument. Do *not* jam the switch or otherwise abuse it.

TO DISASSEMBLE: Turn PEN TIP counter-clockwise. Remove CARTRIDGE or PEN from BARREL ASSEMBLY being careful not to lose SPRING.

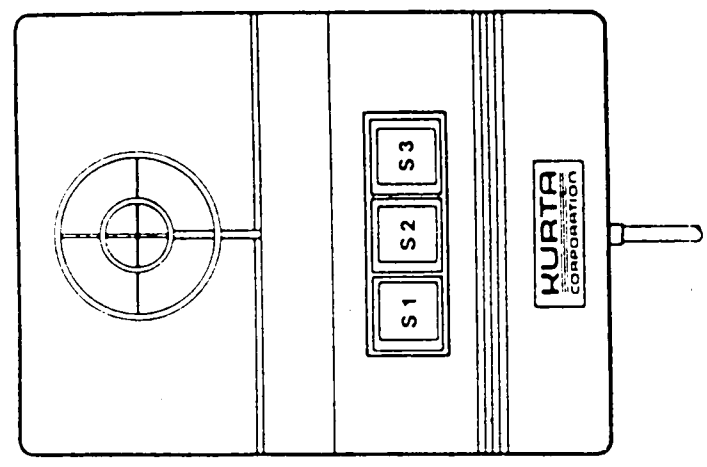
TO REASSEMBLE: Insert new or replacement CARTRIDGE into BARREL ASSEMBLY. Replace SPRING on CARTRIDGE. Replace PEN TIP and turn clockwise to tighten.

NOTE: The CARTRIDGE supplied with pen has *no* ink.



(NOTE: End surface must be kept clean and shiny.)

CURSOR ASSEMBLY



CARE AND HANDLING: Although your 3-Button Cursor is designed of durable plastic, you should exercise care while handling and cleaning it. Do not drop the Cursor or get it wet. Cleaning requires only a soft cloth lightly dampened with a non-abrasive cleaner which does not harm plastics.

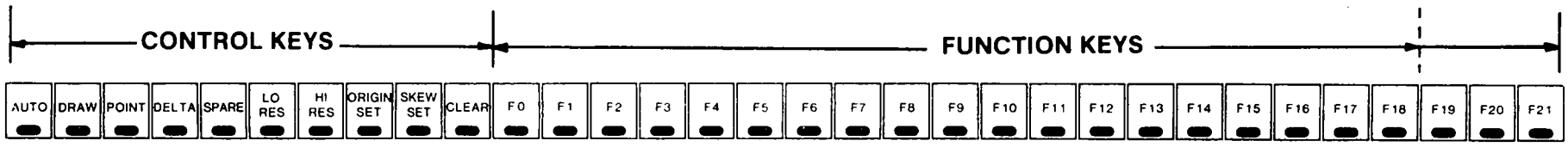
NOTE: DO NOT clean the Cursor with chemicals or abrasive materials which may harm or scratch the plastic—especially the clear lens area.

CURSOR OPERATION: Your optional Cursor has precision crosshairs which allow greater accuracy in locating points to be digitized. The Cursor provides operation equivalent to the Pen when using Switch S1, and much greater capability when using the flexibility of all three switches in conjunction with Software programs.

SWITCHES: Each of the three switches is coded separately, so the switches may be used individually or in tandem giving eight (8) possible combinations. Switch S1 is identical in operation to PEN SWITCH.

MENU KEYBOARD

(Internal Menu Operation - Program Switch 6 must be off.)



CONTROL KEYS

AUTO: Continuous data output when pen/cursor is within proximity of the active area or pen/cursor switch is activated.

DRAW: Continuous data ouput when writing, tracing, or drawing and pen/cursor switch is activated.

POINT: Single point data output upon each pen/cursor switch activation.

DELTA: Single data output for each 0.01 inch predefined increment of pen/cursor movement when pen/cursor switch is activated.

SPARE: Position available for user definition. Output character predefined.

LO RES: Sets resolution to ½ of program switch resolution.

HI RES: Sets resolution to program switch resolution.
(Eg., if program switch resolution [in Model 400, for example] = 400: LO RES = 200, HI RES = 400; if program switch resolution = 200: LO RES = 100, HI RES = 200.)

ORIGIN SET: First pen or cursor switch activation in the surface active area after origin set selection locates the origin (x = 0, y = 0) at that point. X and y output data will increase or decrease from the new origin based on program switch origin setting (upper left, lower left) and resolution. (See Appendix 1: Origin Set and Resolution for more detail.)

SKEW SET: The first pen or cursor switch activation in the surface active area after skew set selection locates a skew or angular correction set.

CLEAR: Resets origin to program switch origin setting (i.e., upper left, lower left).

FUNCTION KEYS

F0-F21: Predefined output character sent to host. Function keys can be used with host and software to select printing or plotting operations, save or load to disk, call new programs or subroutines, request tablet setup parameters to be downloaded, etc.

OPERATION

Once the tablet has been connected to the computer and the Mode/Baud and Program Switches have been set the system is ready to operate. The following checkout procedure will confirm proper operation and provide familiarization. NOTE: Baud Rate is a function of Mode/Baud Switches 3 and 4 and Program Switch 3.

Set the tablet switches as follows:

Mode/Baud Switch	
Point Mode	1 ON and 2 OFF
9600 Baud	3 OFF and 4 ON
Program Switch	
Format 1	1 OFF, 2 OFF
Baud Rates	3 OFF
Resolution (Model 200 = 200, Model 400 = 400, Model 100 = 1000)	4 OFF
Remote mode inactive	5 OFF
Menu internal active	6 OFF
Menu external active	7 OFF
Origin lower left	8 ON

Type in the following BASIC program following the computer instruction:

```
100 DIM IN(5)
110 OPEN "COM1:9600,O,7,1" AS#1
120 I=0
130 IF EOF (1) THEN GOTO 130
140 IN(I)=ASC(INPUT$(1,#1))
150 I=I+1
160 IF I<6 THEN GOTO 130
170 S=60 AND IN(0)
180 X=16384*(3 AND IN(0)) + 128*(127 AND IN(1)) + (127 AND IN(2))
190 Y=16384*(IN(3))+ 128*(127 AND IN(4)) + (127 AND IN(5))
200 PRINT "status = ";
210 PRINT USING "#";S;
220 PRINT "     x = ";
230 PRINT USING "#####";X;
240 PRINT "     Y = ";
250 PRINT USING "#####";Y
260 GOTO 120
```

Type RUN and depress the RETURN key. Touch the pen down in the lower left corner of the active area. The X and Y values should be approximately zero. Since the tablet is set to POINT mode, each time you touch the pen down in the active area a single data output for X and Y will occur.

Now move the pen to the right and confirm that the value of X increases each time you press the pen down. Do the same for Y. The values of X and Y should change (Model 200 = 200, Model 400 = 400 and Model 1000 = 1000 counts) for each inch of movement in the X or Y direction.

NOTE: Pressing the pen down activates the pen switch which transmits the signal to the computer. Press the pen firmly but do not strike the pen tip on the surface as that action may damage both the pen and the surface.

Place the pen on the menu keyboard over the LO RES menu location. Press the pen down on the circular black area under the word LO RES. Now touch the pen down on the active area several times as you move from left to right. Confirm that the resolution is one half of what it was before.

Try to activate the pen on a surface away from the tablet, no X or Y data should appear.

Touch the pen to ORIGIN SET and then to a location in the center of the tablet. The data should be zero upon pen down and should increase in value to the right and up from this new origin location. This capability can be used to set the start point for data or the location of a paper or form. Touch CLEAR to reset the menu to its initial lower left corner position.

OPERATION (continued)

NOTE: When using DELTA, DRAW, or AUTO mode with this TEST program, the volume of tablet output data may cause a BUFFER OVERFLOW condition indicating the computer string buffer is full. If this occurs, restart the BASIC program and reduce the time you transmit data.

Touch the pen to DELTA mode. Now place the pen on the active area. The X and Y position data change only when the pen switch is activated and the pen moves 0.01 inch. If the pen switch is activated and the pen is not moved, data output will stop.

Touch the pen to DRAW mode. Now place the pen on the active area. The X and Y position data should only change when drawing on the surface. Note how the data stops when the pen pressure is removed.

Touch the pen to AUTO mode and raise the pen about two inches above the active area. Lower the pen slowly and note that data will start appearing on the screen when the pen is approximately ½ inch above the surface. No pen switch activation is required.

Spend some time learning the basic functions of the tablet and confirming proper operation. You are then ready to advance to more significant use of the tablet in operation with application software. See Appendix 1: Origin Set and Resolution.

MAINTENANCE AND SERVICE

Your Series TWO graphic tablet does not require periodic maintenance other than normal cleaning and upkeep. Make sure the writing and menu areas are clean and free of conductive material. The pen may need periodic cartridge replacement to maintain a smooth tip or provide ink capability.

TROUBLESHOOTING

If you have trouble, 1) Check all electrical connections, 2) Verify switch settings are proper for Baud rate and software program, 3) Check tablet is operational by using test program, and 4) Verify your software is operating properly.

PROBLEM	POSSIBLE CAUSE	ACTION
Power indicator does not light and/or unit does not appear to operate.	Power switch is OFF.	Turn ON.
	Power cord is not plugged into tablet.	Plug in firmly.
	Power cord is not plugged into operating power source.	Connect and check power.
Tablet is ON but there is no apparent output.	Interface cable is not plugged into tablet or computer.	Plug in firmly.
	Pen or cursor is not plugged in.	Plug in firmly.
	Pen is not in active area or pen switch is not activated.	Place pen within active area and press down firmly.
	Computer software is not operating.	Re boot software and confirm operation.
	Baud rate is not set correctly	Set Mode/Baud switch.
	Program Switch not set properly.	Check Switch settings with software instructions.
	RS232 connection may not be compatible with your computer.	See Appendix 2: RS232 Interface Connector for possible reconfiguration.
Data output appears to be intermittent or spiked.	Pen cartridge is not conducting signal.	Remove and polish top of cartridge with eraser until clean and shiny. See Pen Assembly.
	Pen tip is loose.	Tighten firmly in clockwise direction (must have spring to operate).
Pen will not write with Fisher Space Pen.	Supplied cartridge is a dry or inkless cartridge.	If ink is desired, replace cartridge. See Pen Assembly.
	Ink cartridge is empty	Replace as defined above.
Software Program from diskette doesn't load.	Tablet may not be on or connected properly.	Turn on tablet. If tablet is on, reset. Verify connections and switch settings have been made properly. Contact Software Dealer.
Data output is strange.	Baud rate switches may be set incorrectly.	Set Mode/Baud Switches 3 & 4 and Program Switch 3 to computer Baud rate and push RESET switch.
	Program Switch for Output Format may be set incorrectly.	See Appendix 4: Output Formats. Select proper format, set Program Switch and push RESET Switch.
Menu does not operate.	Program Switches 6 & 7 are not set properly.	See Hardware Configuration and Setup or Software Manual for proper switch settings. Set switches and push RESET switch.

SPECIFICATIONS

Performance	Resolution	Programmable to 200, 400 or 1000 points per inch (Model 200, 400 or 1000)
	Accuracy	To +/- .015 inch, center
	Conversion rate	To 200 x and y coordinate pairs plus status per second (requires compatible baud rate — see Formats)
Active Area	Writing area	12 x 17 inches (305 x 432 mm)
	Menu keyboard	32 positions
Transducer	Pen	Equipped with dry stylus (can be replaced with Fisher Space Pen with ink)
	Cursor (option)	3 button (can be purchased at dealer)
Modes of operation	Switch selectable power on or reset (default) modes	Auto, Draw, Point, Delta, Resolution, Origin and Skew
	Menu selectable	Auto, Draw, Point, Delta, Resolution, Origin and Skew
Interface	Serial RS232	6 foot cable equipped with DB-25P male connector
	Formats	Binary or ASCII (BCD) (switch selectable)
	Baud rate	To 19,200 Baud (switch selectable)
Microprocessor	Z8	Factory programmed
Technology	Electrostatic	Kurta proprietary design
Mechanical	Tablet with electronics	16D x 20W (407 x 509 mm)
	Weight	8.5 lbs. (3797 gm)
Active/total area ratio	70%	
Environment	Ambient temperature	60°F to 104°F (15°C to 40°C)
	Shock and vibration	Withstands normal office or computer room operation
	Duty cycle	Continuous
Electrical	AC power	115 VAC, 50/60 Hz
Regulatory	FCC	Class B approved DMA8C9 SERIES TWO
	UL	Approved for UL114 and 478

GLOSSARY

Active Area — The 12 x 17 inch area of the surface that may be used for drawing.

Conversion Rate — Number or conversions of x and y coordinate data pairs plus pen/cursor status that occur per second. The output rate is dependent on the Baud rate and format selection.

Data — Numbers or counts that result from the conversion by the tablet of the pen or cursor position into corresponding digital information. The number varies from a value of zero at the origin to a maximum of 17X resolution in the x direction and 12X resolution in the y direction.

Kurta — A "message" in an old pre-biblical language, i.e. a message tablet.

Menu — Area of tablet where pressing the pen at defined surface locations is processed by the tablet or external software as a selection of alternatives.

Menu Keyboard — The 1 x 17 inch area of the surface that has 32 selection locations that can be used to internally control the tablet or output control messages to the host processor. Selections must be made in the lower portion of the area.

Modes of Operation — Auto, Draw, Point, Delta and External configurations of operation. (See definition of each mode in the Hardware Configuration and Setup section.)

Mouse — Little device that will bite you but has been replaced by tablet that will output all that a mouse does plus much, much more.

Origin — Place on surface where x and y position values are set to zero. Upon power up or RESET the origin is in lower left or upper left corner of the active area depending on Program Switch setting. The origin can be relocated to other positions by the origin set function on the Menu Keyboard.

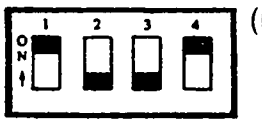
Proximity — Indicates the range or distance the pen or cursor will operate above the menu keyboard or active area.

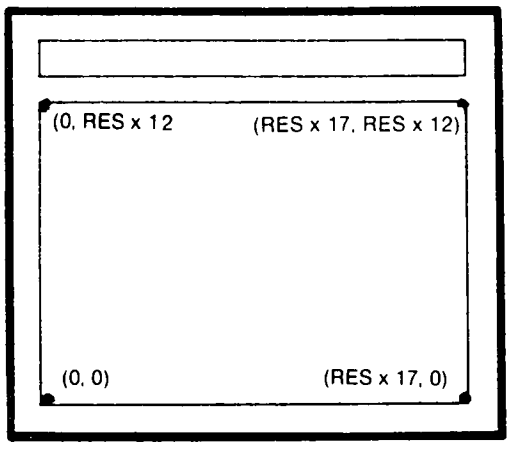
Resolution — The counts per inch or number changes that occur as the pen or cursor is moved.

Status — Output character that defines if the pen or cursor is in promixity of the surface, if the pen switch is activated, if the pen or cursor is located on the menu keyboard or active area and if any one of the cursor buttons are pushed.

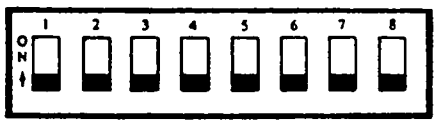
Tablet — Pen or cursor, special writing area and electronics that converts position or writing into corresponding digital data that can be processed by a computer or used for other purposes.

APPENDIX 1: ORIGIN SET AND RESOLUTION

Several examples of ORIGIN and RESOLUTION are provided to assist you in understanding your tablet. Both PROGRAM SWITCHES and MENU CONTROL KEYS are changed to display the powerful capabilities of your graphics tablet. All coordinate pairs are: (X, Y). Set Mode/Baud Switch:  (Point Mode, 9600 Baud). Push RESET after each SWITCH change and verify output.

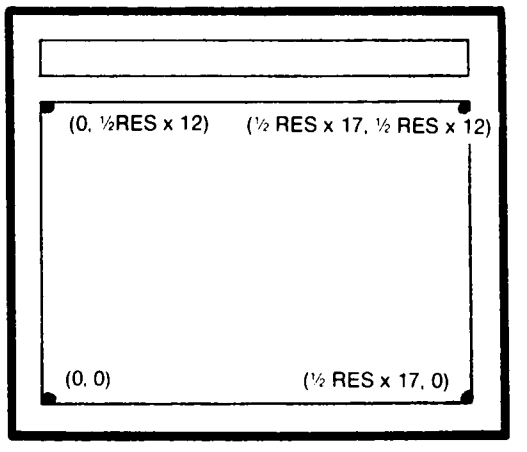


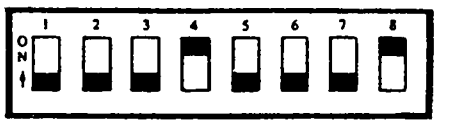
PROGRAM SWITCH



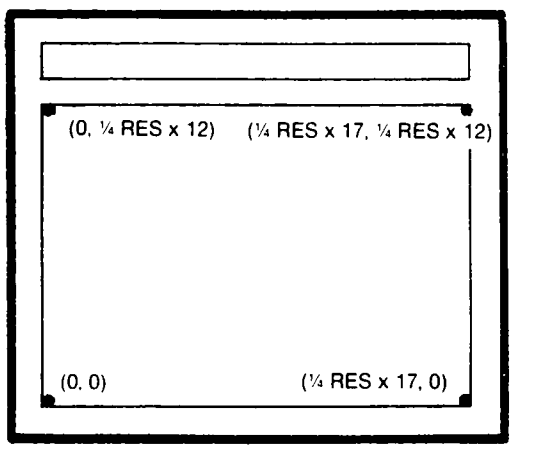
Format 2	1 ON, 2 OFF
Baud rate	3 OFF
*Resolution	4 OFF
Remote mode inactive	5 OFF
Menu internal active	6 OFF
Menu external active	7 OFF

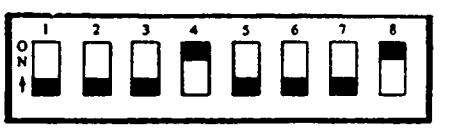
*Where RES = Resolution, Model 200 = 200, Model 400 = 400 and Model 1000 = 1000.





Change Switch 4 to ON.
Push RESET switch.
Resolution drops to one half.

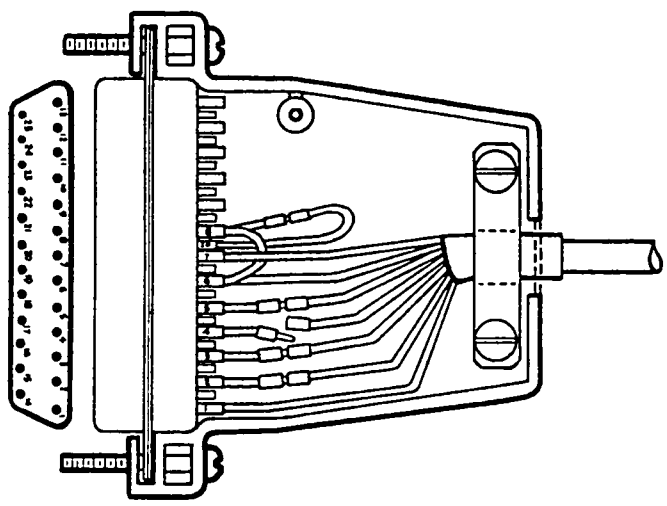




Select Control Key LO RES.
Resolution drops to one fourth.
Do not RESET.

APPENDIX 2: RS232 INTERFACE CONNECTOR

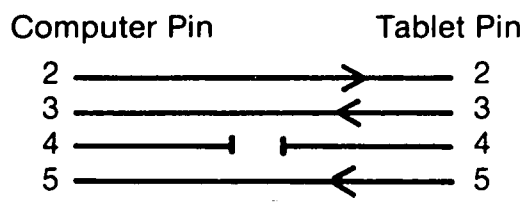
The RS232 cable that comes standard with your unit is equipped with a 25 pin male connector (Type DB-25PS). This connector allows reconfiguration of the cable interface to accommodate different hardware or software requirements. The reconfiguration is made possible through the use of quick disconnect pins within the connector housing.



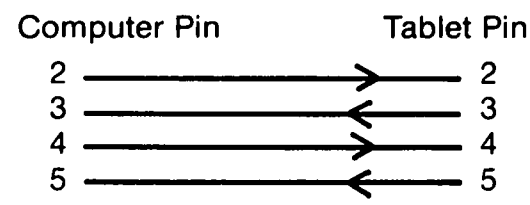
NOTE: Disconnect all power before beginning conversion.
TO DISASSEMBLE: Remove two (2) screws from connector shell by turning counterclockwise. Remove shell.
Make necessary connections.
TO REASSEMBLE: Replace connector shell, insert two (2) screws and tighten by turning clockwise.

PIN #	WIRE COLOR	TABLET FUNCTION	PIN #	TYPICAL COMPUTER FUNCTION
1	Shield/Black	Ground/Return (Shield)	1	Ground
2	Brown	Receive Data In	2	Transmit Data Out
3	Red	Transmit Data Out	3	Receive Data In
4	Orange	Clear to Send (Optional)	4	Request to Send
5	Yellow	Tied to +12VDC, 300 Ohms	5	Clear to Send
6	Green	Tied to +12VDC, 300 Ohms	6	Data Set Ready
7	White	Signal Ground	7	Signal Ground
6 to 8	Buss Wire		8	Carrier Detector
	Buss Wire		20	Data Terminal Ready

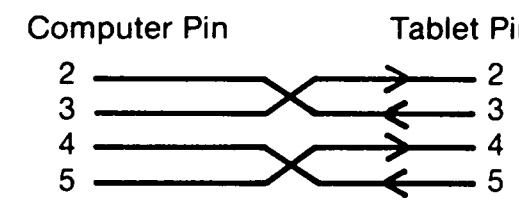
NOTES:
1) If a female connector is required, obtain a shielded adapter from your local computer store.
2) The connector normally is shipped as configured above with Pin 4 disconnected because the tablet does not require Clear to Send to operate. (If Pin 4 is connected, you must have a logic one input or tablet will be inhibited.)
3) If your computer or software program requires the input and output channels to be reversed (consult your computer or software manual), reconfigure the connector as required using the quick disconnect pins.
4) The following diagrams depict some of the common configurations:



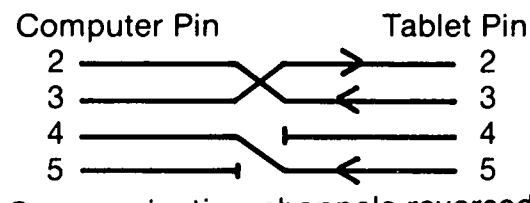
Typical Ship Configuration
Host RTS not used.



Host uses RTS to control tablet output.

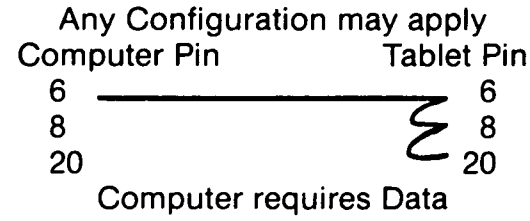


Communication channels reversed.



Communication channels reversed.
Host RTS not used.

Any Configuration may apply



Computer requires Data Terminal Ready

NOTE: Pin 20 is tied high (+12VDC, 300 Ohms) to Pins 5, 6 and 8 but can be disabled if required by disconnecting the jumper.

KURTA
CORPORATION
4610 S 35TH STREET PHOENIX ARIZONA 85040 • (602) 276-5533

NOTICE

THERE IS AN ERROR ON PAGE 16 OF THE USER'S MANUAL CONCERNING THE PROGRAM MESSAGE INPUT FORMAT.

CURRENTLY THE FORMAT LOOKS LIKE:

PROGRAM MESSAGE INPUT FORMAT

				CHARACTER BITS							
CHAR	STOP	STOP	P	B6	B5	B4	B3	B2	B1	B0	START
1	1	1	P	1	0	1	0	0	0	1	0
2	1	1	P	S2-7	S2-6	S2-5	S2-4	0	S2-2	S2-1	0
3	1	1	P	0	0	0	0	S1-2	S1-1	S2-8	0

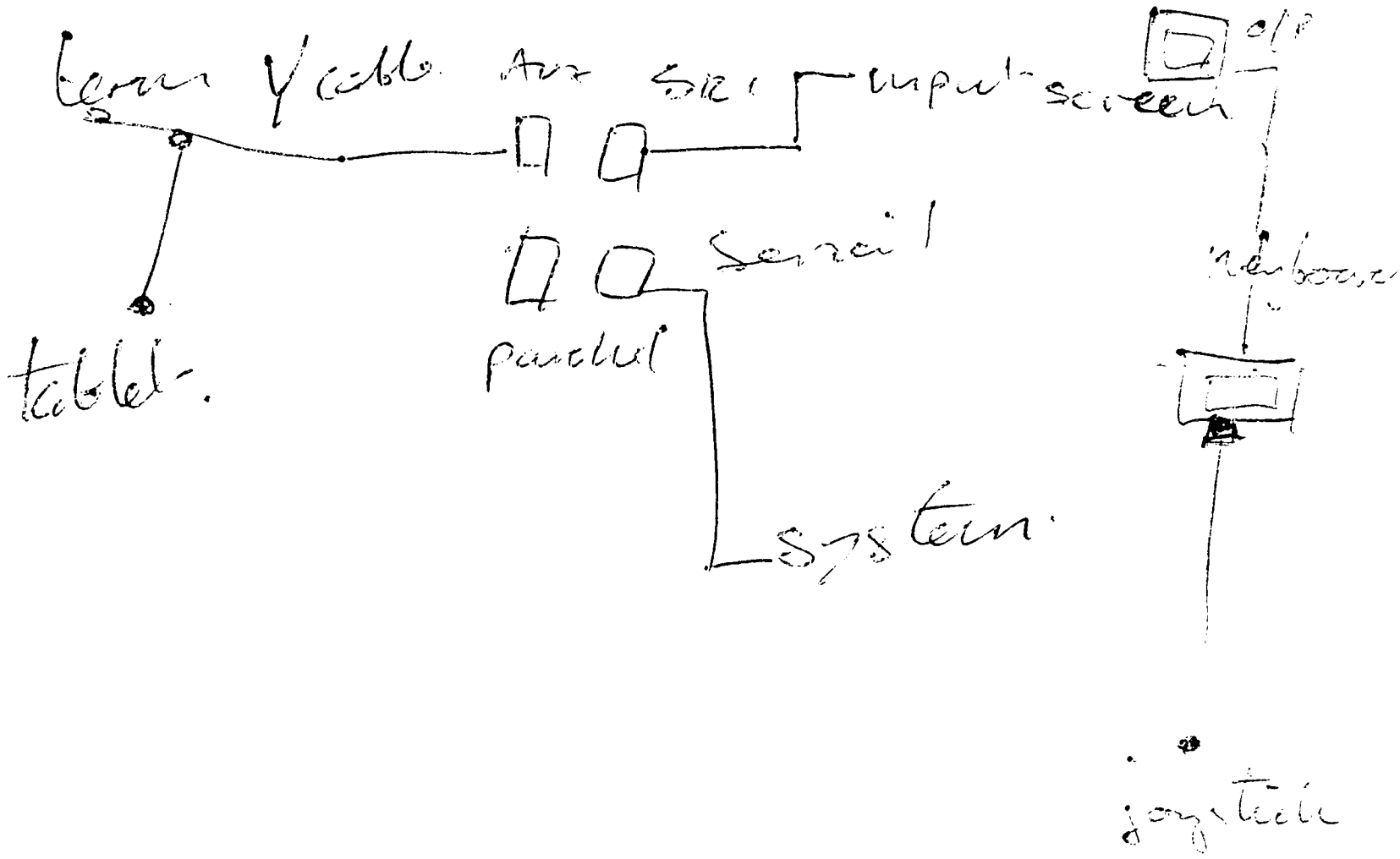
IT SHOULD LOOK LIKE:

PROGRAM MESSAGE INPUT FORMAT

CHARACTER BITS

CHAR	STOP	STOP	P	B6	B5	B4	B3	B2	B1	B0	START
1	1	1	p	1	0	1	0	0	0	1	0
2	1	1	p	S2-7	S2-6	S2-5	S2-4	0	S2-2	S2-1	0
3	1	1	p	0	0	0	0	S1-1	S1-2	S2-8	0

IF YOU HAVE ANY QUESTIONS PLEASE CONTACT KURTA CORPORATION .
(602) 276-5533


tablet.
parallel
Serial
system
o/p
input screen
joystick

APPENDIX 3: INPUT FORMATS

Three INPUT FORMATS have been provided for HOST or SOFTWARE control of your tablet. (Note: On INPUT FORMATS, tablet does not monitor parity bit. This allows you to use 7 data bits and odd parity or 8 data bits and no parity for your OUTPUT FORMATS.)

SINGLE CHARACTER INPUT FORMAT

			CHARACTER BITS								
CHAR.	STOP	STOP	P	B6	B5	B4	B3	B2	B1	B0	START
	1	1	P								0

This format may be used individually to program the tablet to 1) change MODES or RESOLUTION or SET ORIGIN or 2) set MISC CONTROL FUNCTIONS as shown in Table A. Multiple changes or controls are accompanied by sending sequential formats or as required by the program.

For example, if you wish to program tablet to DELTA mode, go to Table A and find HEX character associated with DELTA which is 43. Convert HEX to BINARY using table below.

Character bits in HEX have values as follows:

BIT	B6	B5	B4	B3	B2	B1	B0
VALUE (in HEX)	4	2	1	8	4	2	1

The single character Input Format you would send in BINARY equivalent to HEX 43 is:

			CHARACTER BITS							
STOP	STOP	P	B6	B5	B4	B3	B2	B1	B0	START
1	1	P	1	0	0	0	0	1	1	0

(You have seven (7) character bits and parity is odd.)

PROGRAM MESSAGE INPUT FORMAT

				CHARACTER BITS							
CHAR.	STOP	STOP	P	B6	B5	B4	B3	B2	B1	B0	START
1	1	1	P	1	0	1	0	0	0	1	0
2	1	1	P	S2-7	S2-6	S2-5	S2-4	0	S2-2	S2-1	0
3	1	1	P	0	0	0	0	S1-2	S1-1	S2-8	0

This format may be used to program the tablet to 1) change MODES and 2) change PROGRAM SWITCH functions shown in Table B. For clarity in the Input Format, Mode/Baud Switches are indicated as S1-1 and S1-2 and Program Switches are indicated as S2-1 through S2-8.

Character bits for switch settings are as follows:

OFF = 0 ON = 1

Using the PROGRAM MESSAGE INPUT FORMAT allows you to program or down load *all* switch settings for the table EXCEPT the BAUD RATE which must be manually set prior to POWER ON.

NOTE: This format programs all switch settings *except* BAUD RATE.

NOTE: PROGRAM SWITCH settings determine tablet operation on POWER ON or RESET. Each subsequent single CHARACTER or PROGRAM MESSAGE INPUT FORMAT will supercede (replace) or complement (add to) the PROGRAM SWITCH settings or INPUT FORMATS preceding it.

TABLE A

Menu Functions	Mode/Baud S1	Mode/Baud S2	Menu	ASCII	HEX
Modes					
Auto	OFF	OFF	0	@	40
Draw	OFF	ON	1	A	41
Point	ON	OFF	2	B	42
Delta (0.01 inch)	ON	ON	3	C	43
Resolution					
Fixed					
(Lo) RES			5	E	45
(Hi) RES			6	F	46
Graphic Management					
Set Origin			7	G	47
Skew Set			8	H	48
Origin Clear			9	I	49
MISC CONTROL FUNCTIONS					
Data Request				2	32
Test & Status Request				3	33
Reset	Reset (MOM)			5	35

TABLE B

Mode/Baud Switch Functions

Modes	S1	S2
Auto	OFF	OFF
Draw	OFF	ON
Point	ON	OFF
Delta (0.01 inch)	ON	ON

Program Switch Functions

Output Format	S1	S2
Format 2: Hi Res Packed Binary	ON	OFF
Format 5: Hi Res ASCII (BCD)	ON	ON

Baud Rate	S3
High 19200, 9600, 4800, 2400	OFF
Low 1200, 600, 300, 150	ON

Resolution	S4
Model 200 = 200 Model 400 = 400 Model 1000 = 1000	OFF
Half	ON

Remote Mode	S5
Inactive	OFF
Active	ON

Menu Internal Operation	S6
Active	OFF
Inactive	ON

Menu External Operation	S7
Active	OFF
Inactive	ON

APPENDIX 3: INPUT FORMATS (continued)

RESOLUTION MESSAGE INPUT FORMAT

				CHARACTER BITS							
CHAR.	STOP	STOP	P	B6	B5	B4	B3	B2	B1	B0	START
1	1	1	P	1	0	1	0	0	0	0	0
2	1	1	P	X6	X5	X4	X3	X2	X1	X0	0
3	1	1	P	X13	x12	X11	X10	X9	X8	X7	0
4	1	1	P	Y6	Y5	Y4	Y3	Y2	Y1	Y0	0
5	1	1	P	Y13	Y12	Y11	Y10	Y9	Y8	Y7	0

This format allows you to define tablet resolution by defining the maximum number of counts or points in the X and Y axis, respectively. The maximum count for a 12 x 17 inch active area at 200 points per inch would be 2400 x 3400 points. X and Y may have a different number of points per inch. This format allows you to match the CRT pixel count, the printer or plotter capability, or program restrictions.

Character bits for X and Y are as follows:

OFF = 0 ON = 1

APPENDIX 4: OUTPUT FORMATS

FORMAT 2

- Hi Resolution Packed Binary Message Format out
- Six (6) characters
- To 200 points per inch resolution
- Can be used with existing systems
- B7 = synchronization bit

	CHARACTER BITS										
Character	STOP	STOP	B7	B6	B5	B4	B3	B2	B1	B0	START
1 (Status/ Data)	1	1	1	M	S4	S3	S2	S1	X15	X14	0
2 (Data)	1	1	0	X13	X12	X11	X10	X9	X8	X7	0
3 (Data)	1	1	0	X6	X5	X4	X3	X2	X1	X0	0
4 (Data)	1	1	0	0	0	0	0	0	Y15	Y14	0
5 (Data)	1	1	0	Y13	Y12	Y11	Y10	Y9	Y8	Y7	0
6 (Data)	1	1	0	Y6	Y5	Y4	Y3	Y2	Y1	Y0	0

FORMAT 5

- ASCII Message Format Out
- Twelve (12) characters
- To 1000 points per inch resolution
- Full MENU use for new systems

	CHARACTER BITS										
Character	STOP	STOP	B7	B6	B5	B4	B3	B2	B1	B0	START
1 (Status)	1	1	P	A3	A2	A1	S4	S3	S2	S1	0
2 (Data)	1	1	P	0	1	1	X19	X18	X17	X16	0
3 (Data)	1	1	P	0	1	1	X15	X14	X13	X12	0
4 (Data)	1	1	P	0	1	1	X11	X10	X9	X8	0
5 (Data)	1	1	P	0	1	1	X7	X6	X5	X4	0
6 (Data)	1	1	P	0	1	1	X3	X2	X1	X0	0
7 (Data)	1	1	P	0	1	1	Y19	Y18	Y17	Y16	0
8 (Data)	1	1	P	0	1	1	Y15	Y14	Y13	Y12	0
9 (Data)	1	1	P	0	1	1	Y11	Y10	Y9	Y8	0
10 (Data)	1	1	P	0	1	1	Y7	Y6	Y5	Y4	0
11 (Data)	1	1	P	0	1	1	Y3	Y2	Y1	Y0	0
12 (CR)	1	1	P	0	0	0	1	1	0	1	0

FORMAT NOTES:

X = X (left and right) data bits,, X0 = LSB
Y = Y (up and down)data bits,, YO = LSB
P = Odd parity (if available)
M = Menu (if 0 = data output;
if 1 = menu output: x = menu location,
y = 0. See internal/external menu.)
S1 = When pen or cursor switch No. 1 is activated, S1 = 1 (otherwise S1 = 0)
S2-S4 = Cursor switch No. 2-4 are activated, S2-S4 = 1 respectively (otherwise S2-S4 = 0).
CR = Carriage Return

A3	A2	A1	= Pen/Cursor location and switch status
0	1	0	= No switch activation
0	1	1	= Switch activation in writing area
1	0	0	= Switch activation in menu area

APPENDIX 5: MENUCODER

MENUCODER is a BASIC program which provides an interface between your Kurta tablet and a menu application program.

MENUCODER allows the user to define the menu array and the numeric output for each menu block. The numeric output from the menu block would be used as input to the application program.

Standard menu arrays can be developed by following a few simple rules. Each block must be a multiple of ¼ inch blocks (smallest block would be ¼" x ¼"), rectangular in shape, and numbered from left to right and top to bottom. A single data statement is sufficient for this example: DATA 01, 01, 01, 01, 68, 48, 1. (See program lines 1050-1210 and Example 1.)

NOTE:
- 01: First menu block (X-axis) starts on left edge if positive.
- 01: First menu block (Y-axis) starts on top edge if positive.
- 01: Each menu block is ¼ inch high in X-axis.
- 01: Each menu block is ¼ inch wide in Y-axis.
- 44: There are 68 menu blocks in a row.
- 34: There are 48 menu blocks in a column.
- 01: First menu block (top left hand corner) is number 1
  (First menu block in row 2 will be 69 and last menu block in lower right corner will be 1496.)

To change this example to a menu array of 1 x ½ inch blocks, the data statement would be: DATA 01, 01, 04, 02, 17, 24, 01. (See Example 2.)

MENUCODER will accomodate various sizes of menu blocks, blank areas, and number output schemes within one menu array. PROGRAM LINES 1230-1280 are an example of of a border of ½ x ½ inch menu blocks around the edge of the active area. The menu blocks are numbered sequentially from 1 to 112 in a clockwise manner. (See Example 3.)

NOTE: A separate DATA statement is required: 1) For each rectangular grouping of contiguous same size menu blocks, and 2) each time you change from 'left to right' to 'right to left,' or from 'top to bottom' to 'bottom to top' numbering sequence.

MENUCODER also allows you to include up to 50 separate menu arrays or SCREENS in your program. The data format for each SCREEN is:

DATA 100: SCREENS have DATA statement numbers ranging from 100 to 149.

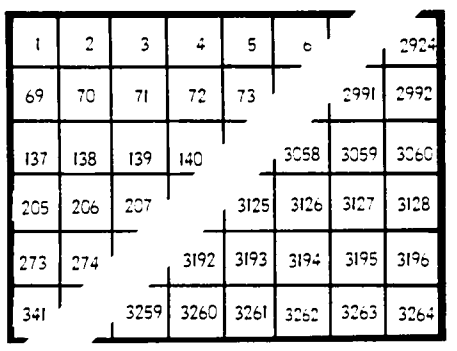
DATA : Define menu array.

DATA 150: SCREEN terminator. Each individual SCREEN definition must end with DATA 150.

PROGRAM LINE 1330 defines the SCREEN number for the program to call. SCREEN 100 in the DATA statements equals 0 in program line 1330; SCREEN 101 equals 01; and SCREEN 149 equals 49. You may want to change this to an input field.

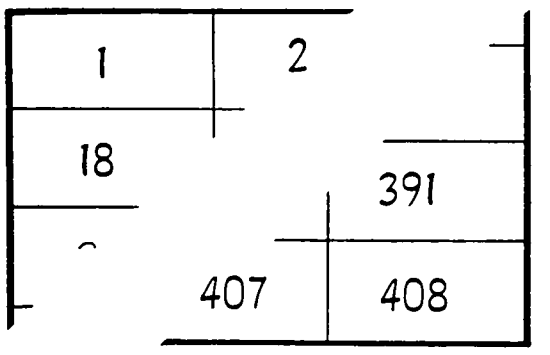
MENUCODER numeric output is printed to the computer screen in Program Lines 1400-1404. This would be the place to tie in your application program requiring menu output.

Example 1



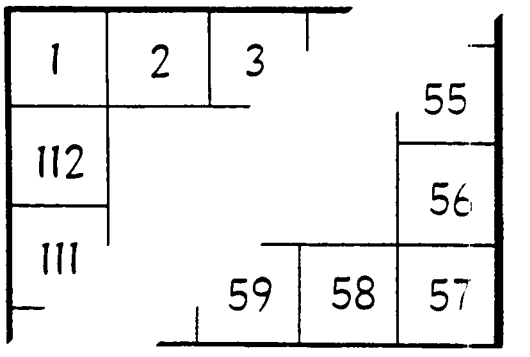
¼ x ¼ inch blocks
Data 01, 01, 01, 01, 68, 48, 1

Example 2



1 x ½ inch blocks
Data 01, 01, 04, 02, 17, 24, 01

Example 3



½ x ½ inch blocks
See Program Lines 1240-1270

MENUCODER (continued)

Program Lines	Description
1000 - 1040	Defines tablet size and counts per block
1050 - 1220	Defines setup parameters for menu array
1230 - 1290	Example for menu that forms border of ½" blocks around (active area)
1300 - 1320	Establishes communications between BASIC program and tablet.
1330 - 1340	Unpacks parameters for designated SCREEN (menu array)
1390 - 1410	Sample output from tablet interface to user application program. MENUCODER currently outputs: MENU (menu number), X (X coordinate), Y (Y coordinate).

```
1010 DIM MENU(67,47),IN(5)        ' SERIES II      1000 PPI     FORMAT 2
1013 '
1015 '*** VALUES FOR X25,Y25: 50(200PPI), 100(400PPI), 250(1000PPI) ***
1020 X25=250                      ' COUNTS/.25 IN  (17  IN=17000)
1030 Y25=250                      ' COUNTS/.25 IN  (12  IN=12000)
1040 '
1050 ' THE MENU BLOCKS ARE CREATED BY A SET OF PARAMETERS.  ONE ENTRY
1060 ' DEFINES ANY SET OF SIMILAR SPACE WISE CONTIGUOUS BLOCKS.  EACH
1070 ' ENTRY IS AS FOLLOWS:
1080 '
1090 '    STARTING X  /  SCREEN NUMBER  /  TERMINATOR
1100 '       1-68  STARTING X  - .25 IN/COUNT
1110 '                         - LEFT END IF POSITIVE 'BLOCK SIZE X'
1120 '    100-149  SCREEN NUMBER (BEGINNING) - 00-49
1130 '        150  TERMINATOR
1140 '    STARTING Y     1-48  - .25 IN/COUNT
1150 '                         - TOP IS POSITIVE 'BLOCK SIZE Y'
1160 '    BLOCK SIZE X   1-68  - .25 IN/COUNT
1170 '    BLOCK SIZE Y   1-48  - .25 IN/COUNT
1180 '    NR BLOCKS  X   1-68
1190 '    NR BLOCKS  Y   1-48
1200 '    STARTING NR    1-65535  - LEFT TO RIGHT (POSITIVE 'BLOCK SIZE X')
1210 '                              TOP TO BOTTOM (POSITIVE 'BLOCK SIZE Y')
1220 '
1230 DATA  100:                   ' SCREEN NR 00
1240 DATA  01,01,02,02,34,01,01: ' 01-34  LEFT TO RIGHT BORDER (TOP)
1250 DATA  67,03,02,02,01,22,35: ' 35-56  TOP TO BOTTOM BORDER (RIGHT)
1260 DATA  68,48,-2,-2,34,01,57: ' 57-90  RIGHT TO LEFT BORDER (BOTTOM)
1270 DATA  01,46,02,-2,01,22,91: ' 91-112 BOTTOM TO TOP BORDER (LEFT)
1280 DATA  150:                   ' TERMINATOR
1290 '
1300 ' OPEN COMM FILE AND UNPACK FORMAT
1310 '
1320 OPEN "COM1:9600,O,7,1" AS#1
1330 SCRN=0
1340 GOSUB 1700
1350 PRINT "READY FOR COMMUNICATIONS"
1360 '
1370 ' INPUT A POINT FROM THE TABLET AND DISPLAY ON THE CRT
1380 '
1390 GOSUB 1500
1400 PRINT "MENU ";:PRINT USING "####";MENUNR;
1402 PRINT "    X= ";:PRINT USING "######";X;
1404 PRINT "    Y= ";:PRINT USING "######";Y
1410 GOTO 1390
1420 '
1430 ' GET A POINT AND CHECK IF A MENU BLOCK
1440 '
1450 ' RET:  'MENUNR'   <> 0  MENU BLOCK NR
1460 '                  =  0  POINT NOT IN MENU BLOCK
1470 '       'X'              X COORDINATE
1480 '       'Y'              Y COORDINATE
1490 '
1500 I=0
1510 IF EOF(1) THEN GOTO 1510
1520 IN(I)=ASC(INPUT$(1,#1))
1530 I=I+1
1540 IF I<6 THEN GOTO 1510
1550 X=16384*(3 AND IN(0)) + 128*(127 AND IN(1)) + (127 AND IN(2))
1560 Y=16384*(IN(3)) + 128*(127 AND IN(4)) + (127 AND IN(5))
1570 WX=INT(X/X25)
1580 WY=INT(Y/Y25)
1590 MENUNR=MENU(WX,WY)
```

```
1600 RETURN
1610 '
1620 ' SET UP THE MENU BLOCK AREA
1630 '
1640 ' ENT:  SCREEN    SCREEN NUMBER (00-48)
1650 '
1660 ' RTN:  MENU(X,Y) SET-UP FOR CURRENT SCREEN
1670 '       F         0=SCREEN NUMBER NOT VAILD
1680 '                 1=SCREEN PARAMETERS UNPACKED
1690 '
1700 IF IPARM=0 THEN GOTO 1740
1710 FOR X=0 TO 67
1720 FOR Y=0 TO 47:MENU(X,Y)=0:NEXT Y
1730 NEXT X
1740 IPARM=1
1750 F=0
1760 RESTORE
1770 READ X
1780 IF X=150 THEN RETURN
1790 IF X> 99 THEN IF SCRN+100 = X THEN GOTO 1860
1800 IF X> 99 THEN GOTO 1770
1810 READ Y,BX,BY,NRX,NRY,NR
1820 GOTO 1770
1830 '
1840 ' FOUND SCREEN NR, READ PARAMETERS
1850 '
1860 READ X
1870 IF X=150 THEN F=1:GOSUB 2130:RETURN
1880 IF X> 99 THEN F=1:RETURN
1890 READ Y,BX,BY,NRX,NRY,NR
1900 X=X-1:Y=Y-1
1910 WX=X:WY=Y:WBX=BX:WBY=BY:WNRX=NRX:WNRY=NRY:WNR=NR
1920 MENU(WX,WY)=WNR
1930 IF WBX > 0 THEN WX=WX+1:WBX=WBX-1
1940 IF WBX < 0 THEN WX=WX-1:WBX=WBX+1
1950 IF WBX <> 0 THEN GOTO 1920
1960 WBX=BX
1970 WNR=WNR+1
1980 WNRX=WNRX-1
1990 IF WNRX <> 0 THEN GOTO 1920
2000 WNRX=NRX
2010 IF BY>0 THEN WY=WY+1
2020 IF BY<0 THEN WY=WY-1
2030 IF WBY > 0 THEN WBY=WBY-1
2040 IF WBY < 0 THEN WBY=WBY+1
2050 IF WBY <> 0 THEN WNR=NR:WX=X:GOTO 1920
2060 WY=WY+WBY
2070 WBY=BY
2080 NR=NR+NRX
2090 WNRY=WNRY-1
2100 IF WNRY <> 0 THEN WNR=NR:WX=X:GOTO 1920
2110 GOTO 1860
2120 RETURN
2130 FOR I=0 TO 67:FOR J=0 TO 23
2140 TEMP=MENU(I,J):MENU(I,J)=MENU(I,47-J)
2150 MENU(I,47-J)=TEMP
2160 NEXT J:NEXT I
2170 RETURN
```

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